CLAIMS

1. A steel pipe, which could be expanded after being embedded in a well, characterized in that the non-uniform wall thickness ratio E0 (%) before expanding satisfies the following expression 1.

$$E0 \leq 30/(1 + 0.018\alpha) \quad \cdots 1$$

Wherein α is pipe expansion ratio (%) calculated by the following expression 2.

α= [(inner diameter of the pipe after expanding – inner diameter of the pipe before expanding)/inner diameter of the pipe before expanding] ×100 $\cdots 2$

2. A steel pipe, which could be expanded after being embedded in a well, characterized in that eccentric non-uniform wall thickness ratio is 10 % or less.

3. A steel pipe according to claim 1, consisting of, by mass %, C: 0.1 to 0.45 %, Si: 0.1 to 1.5 %, Mn: 0.1 to 3 %, P: 0.03 % or less, S: 0.01 % or less, sol.Al: 0.05 % or less, N: 0.01 % or less, Ca: 0 to 0.005 %, and the balance Fe and impurities.

4. A steel pipe according to claim 1, consisting of, by mass %, C: 0.1 to 0.45 %, Si: 0.1 to 1.5 %, Mn: 0.1 to 3 %, P: 0.03 % or less, S: 0.01 % or less, sol.Al: 0.05 % or less, N: 0.01 % or less, Ca: 0 to 0.005 %, one or more of Cr: 0.2 to 1.5 %, Mo: 0.1 to 0.8 % and V: 0.005 to 0.2 %, and the balance Fe and impurities.

5. A steel pipe according to claim 3, containing one or both of, by mass %, Ti 0.005 to 0.05 % and Nb: 0.005 to 0.1 % in place of a part of Fe.

6. A method of embedding oil well steel pipes having smaller diameters one after another, characterized by using the steel pipe according to claim 1 and by comprising the steps of;

embedding a steel pipe in an excavated well,

further excavating the underground on the front end of the embedded steel pipe to deepen the well,

inserting a steel pipe, whose outer diameter is smaller than the inner diameter of the embedded steel pipe, into the embedded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially by a tool inserted therein to increase the diameter,

further excavating the underground on the front end of the expanded steel pipe to deepen the well,

inserting another steel pipe, whose outer diameter is smaller than the inner diameter of the expanded steel pipe, into the expanded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially, and

repeating said steps.

7. A steel pipe according to claim 2, consisting of, by mass %, C: 0.1 to 0.45 %, Si: 0.1 to 1.5 %, Mn: 0.1 to 3 %, P: 0.03 % or less, S: 0.01 % or less, sol.Al: 0.05 % or less, N: 0.01 % or less, Ca: 0 to 0.005 %, and the balance Fe and impurities.

8. A steel pipe according to claim 2, consisting of, by mass %, C: 0.1 to 0.45 %, Si: 0.1 to 1.5 %, Mn: 0.1 to 3 %, P: 0.03 % or less, S: 0.01 % or less, sol.Al: 0.05 % or less, N: 0.01 % or less, Ca: 0 to 0.005 %, one or more of Cr: 0.2 to 1.5 %, Mo: 0.1 to 0.8 % and V: 0.005 to 0.2 %, and the balance Fe and impurities.

9. A steel pipe according to claim 4, containing one or both of, by mass %, Ti 0.005 to 0.05 % and Nb: 0.005 to 0.1 % in place of a part of Fe.

10. A method of embedding oil well steel pipes having smaller diameters one after another, characterized by using the steel pipe according to claim 2 and by comprising the steps of;

embedding a steel pipe in an excavated well,

further excavating the underground on the front end of the embedded steel pipe to deepen the well,

inserting a steel pipe, whose outer diameter is smaller than the inner diameter of the embedded steel pipe, into the embedded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially by a tool inserted therein to increase the diameter,

further excavating the underground on the front end of the expanded steel pipe to deepen the well,

inserting another steel pipe, whose outer diameter is smaller than the inner diameter of the expanded steel pipe, into the expanded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially, and

repeating said steps.

11. A method of embedding oil well steel pipes having smaller diameters one after another, characterized by using the steel pipe according to claim 3 and by comprising the steps of;

embedding a steel pipe in an excavated well,

further excavating the underground on the front end of the embedded steel pipe to deepen the well,

inserting a steel pipe, whose outer diameter is smaller than the inner diameter of the embedded steel pipe, into the embedded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially by a tool inserted therein to increase the diameter,

further excavating the underground on the front end of the expanded steel pipe to deepen the well,

inserting another steel pipe, whose outer diameter is smaller than the inner diameter of the expanded steel pipe, into the expanded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially, and

repeating said steps.

12. A method of embedding oil well steel pipes having smaller diameters one after another, characterized by using the steel pipe according to claim 4 and by comprising the steps of;

embedding a steel pipe in an excavated well,

further excavating the underground on the front end of the embedded steel pipe to deepen the well,

inserting a steel pipe, whose outer diameter is smaller than the inner diameter of the embedded steel pipe, into the embedded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially by a tool inserted therein to increase the diameter,

further excavating the underground on the front end of the expanded steel pipe to deepen the well,

inserting another steel pipe, whose outer diameter is smaller than the inner diameter of the expanded steel pipe, into the expanded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially, and

repeating said steps.

13. A method of embedding oil well steel pipes having smaller diameters one after another, characterized by using the steel pipe according to claim 5 and by comprising the steps of;

embedding a steel pipe in an excavated well,

further excavating the underground on the front end of the embedded steel pipe to deepen the well,

inserting a steel pipe, whose outer diameter is smaller than the inner diameter of the embedded steel pipe, into the embedded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially by a tool inserted therein to increase the diameter,

further excavating the underground on the front end of the expanded steel pipe to deepen the well,

inserting another steel pipe, whose outer diameter is smaller than the inner diameter of the expanded steel pipe, into the expanded steel pipe, and embedding the steel pipe in the deepened portion of the well,

expanding the steel pipe radially, and

repeating said steps.